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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,841	10/30/2003	Peter Hinterdorfer	MOL 0074 PA/40518.102	9286

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EXAMINER

CYGAN, MICHAEL T

ART UNIT	PAPER NUMBER
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2855

DATE MAILED: 02/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AP

Office Action Summary	Application No. 10/697,841	Applicant(s) HINTERDORFER ET AL.	
	Examiner Michael Cygan	Art Unit 2855	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 December 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-21 and 26-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-3,5-12,20,21 and 26-33 is/are allowed.
- 6) ☒ Claim(s) 13-19 and 34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claims 13-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wong (Nature 1998) in view of Doris (US 5,383,354). Wong discloses a recognition force microscope comprising a scanning probe having a tip functionalized with a molecule, the functionalized tip being sensitive to a property of a scanned surface through a binding and/or adhesion interaction; see Figures 1 and 3. The probe is adapted to oscillate at a low mechanical

Q-factor; see caption of Figure 2. The microscope includes a means for recording probe displacement over time such that both the topographic and spatial locations of interactions are measured and recorded; a Nanoscope III electronic control system interprets "tapping mode" cantilever vertical swing amplitudes and provides topographic and interaction spatial images as shown in Figure 2 and the caption. Figures 1 and 3 portray system used for detecting specific (amine-substrate functional) and specific antibody (biotin-streptavidin) binding events during scanning. Figure 3 shows the biotin attached to the nanotube-functionalized tip through a flexible linkage. See entire document.

Wong teaches the claimed invention except for optical detection as claimed and the measurement of tip oscillation amplitude for tip height feedback. Doris teaches AFM tapping mode operation using a laser beam/photodetector with electronic control in combination with tapping mode operation, which is taught to consist of measurement of the amplitude (both upwards & downwards) of a cantilever oscillating at its fundamental frequency, determination of damping of the amplitude, and control of tip height to maintain a desired tip amplitude; see column 1 lines 13-25 and 42-54. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the laser beam/photodetector with electronic control in combination with measurement of the amplitude as taught by Doris in the invention taught by Wong to perform tapping mode

operation, since Doris teaches such techniques as standard in the art for AFM tapping mode operation. Note that Wong discloses AFM tapping mode operation as the method for obtaining the results of Figure 2. Note that measurement of amplitude damping responsive to tip-surface interaction is the same as measurement of cantilever average deflection when measured at the ca. 30 kHz cantilever vibrational frequencies and ca. 1 Hz scanning frequencies of Wong.

With respect to claim 15, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the claimed range, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, see *In re Aller* 105 USPQ 233. The advantage of a sharper control signal would be gained thereby.

2. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wong (Nature 1998) in view of Doris (US 5,383,354), further in view of Han (App. Phys. Lett. 1995). Wong teaches the claimed invention except for magnetic excitation. Han teaches magnetic excitation for tapping mode AFM; see page 4111. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use magnetic excitation as taught by Han in the invention taught by Wong to excite the AFM, since Han teaches that this leads to higher resolution.

Allowable Subject Matter

3. Claims 1-3, 5-12, 20, 21, and 26-33 are allowed.

Response to Arguments

4. Applicant's arguments filed 21 December 2004 have been fully considered but they are not persuasive. The microscope taught by Wong includes a means for recording probe displacement (including upward and downward) over time such that both the topographic and spatial locations of interactions are measured and recorded; a Nanoscope III electronic control system interprets "tapping mode" cantilever vertical swing amplitudes and provides topographic and interaction spatial images.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Cygan whose telephone number is (571) 272-2175. The examiner can normally be reached on 8:30-6 M-Th, alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on 571-272-2180. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


MICHAEL CYGAN, PH.D.
PRIMARY EXAMINER